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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,086	10/02/2003	Yasuyuki Saito	03560.003368	7763

5514 7590 08/14/2006

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EXAMINER	
RIELLEY, ELIZABETH A	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/676,086	SAITO ET AL.	
	Examiner	Art Unit	
	Elizabeth A. Rielley	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Amendment filed 6/5/06 has been entered and considered by the Examiner. Claims 9 and 14-16 have been canceled. Currently, claims 17-21 are pending in the instant application.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/5/06 has been entered.

Claim Objections

Claims 17-21 objected to because of the following informalities: claim 17 states, "an end of said transporting tube at said second chamber side faces said electrode located on said substrate" however there is no mention in this claim of an electrode on the substrate in the second chamber. For the purpose of this examination, the Examiner will understand the stage in part (b) to be an electrode. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garvey et al (US 6797336) in view of Inaba et al (US 6638403).

In regard to claims 17 and 18, Garvey et al ('336) teaches an apparatus for manufacturing an electron-emitting device (30; figure 1; column 6 lines 4-20) including carbon fibers (column 12 lines 35-55; column 6 lines 11-13) on an electrode (34, 37; column 6 lines 11-13) located on a substrate (not in figures; column 6 lines 11-13 disclose that the cathode and anode comprised of the material to be deposited are mounted in a housing that is not shown. The mounting is the substrate for the cathode and anode) comprising; a first chamber (79) for generating carbon fibers having disposed therein an anode containing carbon (34; column 12 lines 35-55 disclose the manufacturing of carbon nanotubes with this PAMBD method) and a cathode (36) facing said anode (see figure 1); a second chamber (81) containing a stage (not numbered; housing of second chamber 81 where 87 is located; column 6 lines 9-11) on which the substrate is located (87); a unit for forming an aerosol of said generating carbon fibers (since an aerosol is "a substance enclosed under pressure and released as a fine spray"[1], and the carbon nanotubes are formed in chamber 79, operated under a pressure of 10^{-4} to 10^{-2} pressure (column 6 lines 16-18); the pressure difference between the two chambers causes the carbon nanotubes to be ejected from chamber 79 to chamber 81 (column 6 lines 19-20). Therefore this device 30 forms an aerosol of the generating carbon fibers); a transporting orifice (83; column 6 lines 14-16) connecting the first and second chambers for transporting the aerosol from said first chamber to said second chamber (column 6 lines 14-16), wherein an end of said transporting orifice at said second chamber said faces the substrate used for depositing the carbon fibers (87; see figure 1) and a pressure controlling means for providing a pressure in

[1] http://www.askoxford.com/concise_oed/aerosol?view=uk

the first chamber that is greater than a pressure in the second chamber for conducting the aerosol through the transporting tube (column 6 lines 16-19).

Garvey et al ('336) are silent regarding the limitation of a transporting tube for connecting the first (79) and second chambers (81) for transporting the carbon fibers from said first chamber to said second chamber and that an end of said transporting tube at said second chamber said faces an electrode located on the substrate in the second chamber, and a nozzle connected to the end of the transporting tube. However, one skilled in the art would reasonably contemplate modifying the device of Garvey et al ('336) to include the claimed structures of the apparatus, that is, the transporting tube with nozzle and the electrode located on the substrate in the second chamber, as an obvious matter of design engineering as evidenced by Inaba et al ('403). In the same field of endeavor, Inaba et al ('403) teaches an apparatus for manufacturing an electron emitting device including carbon fibers (column 3 lines 34-65) comprising a transportation tube for transforming the manufactured carbon fibers (33; column 9 lines 24 to column 10 line 30) with a nozzle at the end (30, 26; column 8 line 65 to column 9 line 15; see figure 11) and an electrode located on the substrate onto which carbon fibers are deposited (8 is electrically conductive and therefore an electrode; column 4 lines 11-16). These carbon fibers, as taught by Inaba, are transported in part by vacuum pressure (column 4 lines 3-10 and column 9 lines 25-30). Applicant's claimed material does not provide unexpected results that are not within the teaching applied, since both apparatuses disclosed in Garvey and Inaba as well as the apparatus disclosed by the Applicant perform the same function of manufacturing electron emitting devices by arc discharge and transporting the carbon fibers made by vacuum pressure.

Thus, it would have been obvious at the time of the invention to one of ordinary skill in the art to incorporate the transportation tube as well as the electrode located on the substrate in the second chamber of Inaba et al with the apparatus for manufacturing carbon fibers as taught by Garvey et al. Motivation to combine would be to provide an apparatus for manufacturing carbon fibers and transferring them from one chamber to the next under pressure.

In regard to claim 20, Garvey et al ('336) teaches the unit for forming the aerosol is an inert gas introducing unit for introducing an inert gas to the first chamber (72; column 6 lines 4-14 and column 12 lines 35-40)

Claims 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garvey et al (US 6797336) in view of Inaba et al (US 6638403) in view of as applied to claim 17 above, and further in view of Ishikura et al (JP 2000-208033).

Garvey/Ishikura teach all the limitations set forth, as described above, except that a heater is included in the nozzle and the aerosol is ejected from the nozzle at 10 m/s or faster. In the same field of endeavor, Ishikura et al ('033) teach a thin film forming apparatus in which a heater is included in a nozzle (paragraph 41) in order to avoid clogging the nozzle and connecting tube (paragraph 41). Ishikura ('033) also teaches ejecting the film from the nozzle at high speed (abstract), which 10 m/s is ordinary known in the art to be considered high speed for a nozzle[2]. Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the apparitions of Inaba/Garvey with the heating device and nozzle of Ishikura. Motivation to combine would be to avoid clogging the nozzle and the connecting tube.

Response to Arguments

Applicant's arguments with respect to claims 17-21 have been considered but are moot in view of the new ground(s) of rejection.

[2] Please see US Patent 5951350 column 13 lines 24-34.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth A. Rielley whose telephone number is 571-272-2117. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elizabeth Rielley

Examiner
Art Unit 2879

MARICELI SANTIAGO
PRIMARY EXAMINER